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(71) Applicant(s)
Michael Henry McGarvey
50 Raeburn Meadow, SELKIRK, TD7 4HN,
United Kingdom

Philip Baker
38 Ash Tree Grove, Kippax, LEEDS, LS25 7QA,
United Kingdom

(72) Inventor(s)
Michael Henry McGarvey
Philip Baker

(74) Agent and/or Address for Service
Haseltine Lake & Co
Imperial House, 15-19 Kingsway, LONDON,
WC2B 6UD, United Kingdom

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GB 2314647 A   WO 01/41023 A1
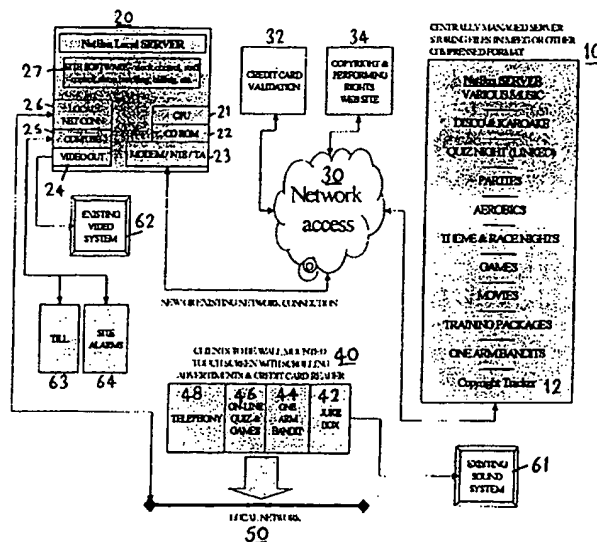US 5930765 A   US 5781889 A

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(54) Abstract Title
An Entertainment System

(57) An entertainment system comprises a central server 10 having means for storing data files for use in electronic entertainment and connected to a telecommunication network 30. The system has a local server 20 having means for communicating with the central server 10 via the telecommunication network 30, means for downloading selected data files from the central server, and means for storing the downloaded data files. The system has at least one client computer connected to the local server 20 via a local network 50 which comprises input means for allowing a user to specify a desired file, payment means for receiving payment from the user for use of the desired data file and processing means for causing the desired data file to be processed. The files may be music, video or game files. The system may be arranged to provide a telephony service 48. The system may be used in a public house, restaurant, club or like establishment. In an alternative embodiment a client computer for use in an entertainment device is operable at least as a jukebox 42 and may display advertisements. The client computer may be used to order food and/or beverage items.
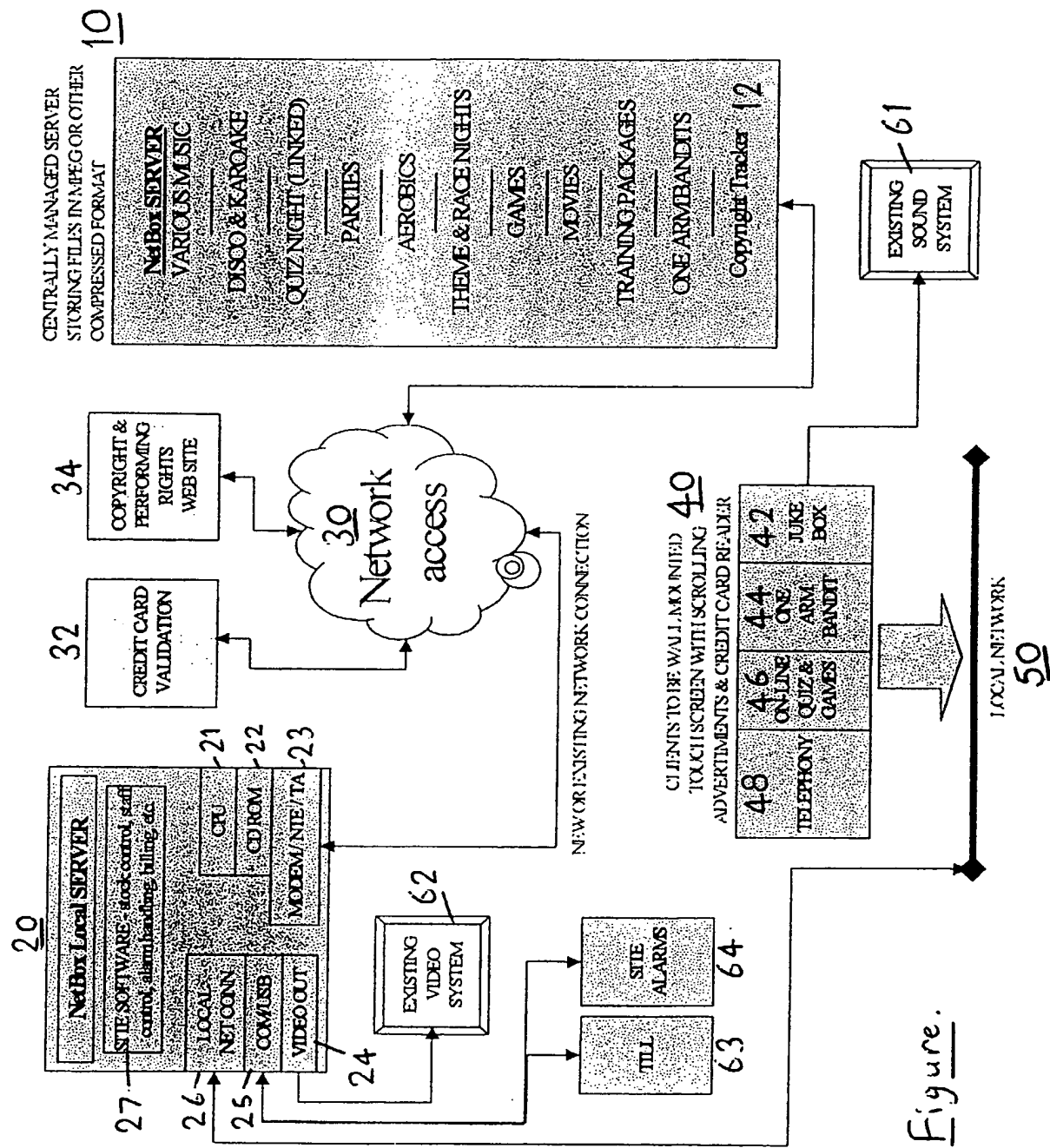
The claims were filed later than the filing date but within the period prescribed by Rule 25(1) of the Patents Rules 1995.

GB 2 371 670 A

CENTRALLY MANAGED SERVER STORING FILES IN MPEG OR OTHER COMPRESSED FORMAT

10

NetBox SERVER
VARIOUS MUSIC

DISCO & KARAOKE

QUIZ NIGHT (LINKED)

PARTIES

AEROBICS

THEME & RACE NIGHTS

GAMES

MOVIES

TRAINING PACKAGES

ONE ARM BANDITS

Copyright Tracks **12**

61 EXISTING SOUND SYSTEM

34 COPYRIGHT & PERFORMING RIGHTS WEB SITE

32 CREDIT CARD VALIDATION

30 Network access

NEW OR EXISTING NETWORK CONNECTION

CLIENTS TO BE WALL MOUNTED **40**
TOUCH SCREEN WITH SCROLLING
ADVERTISEMENTS & CREDIT CARD READER

42 JUKE BOX

44 ONE ARM BANDIT

46 ON-LINE QUIZ & GAMES

48 TELEPHONY

50 LOCAL CLIENT

20

NetBox Local SERVER

SITE SOFTWARE - stock control, staff control, alarm handling, billing, etc.

21 CPU

22 CD ROM

23 MODEM/NTE/TA

26 LOCAL NET CONN

25 COM/USB

24 VIDEO OUT

27

62 EXISTING VIDEO SYSTEM

64 SITE ALARMS

63 TILL

ENTERTAINMENT SYSTEM

The present invention relates to an entertainment system for use in an establishment such as a public house, and capable of providing various entertainment facilities including, for example, those of a jukebox.

Jukeboxes have been employed in public houses and other such establishments for many years. Conventionally, they permit members of the public to hear a piece of music selected from an available range stored within the jukebox. Originally, pieces of music were stored as vinyl records, but more recently CDs have been used instead.

Although the audio CD offers a greater storage capacity and hence enables a wider range of music selections compared with vinyl recordings, both types of carrier have the fundamental disadvantage that the choice of music available to a user is restricted to those pieces which are currently stored in the jukebox. This also means that in order to update or change the selection of music available, time-consuming work of swapping discs is required. On the other hand, such swapping of discs may be essential in order to follow rapidly-changing tastes in music.

Public houses offer more types of entertainment than just music. Games machines such as one-armed bandits and interactive quiz games are commonly provided. In addition, a video screen may show sports television or the like. All in all, public houses, clubs and other places of public entertainment are coming to rely increasingly on electronic apparatus of various types. However, the provision of many separate and unrelated types of such apparatus raises problems of updating and management of the apparatus.

In view of the above problems, it is desirable to

provide a means for providing the functions of a
jukebox which is not confined to a pre-stored selection
of music.

Furthermore, it is desirable to provide a means by
which previously unrelated entertainment functions can
be integrated into a system allowing easy updating and
management.

According to one aspect of the present invention,
there is provided an entertainment system, comprising:

a central server having means for storing data
files for use in electronic entertainment, and
connected to a telecommunications network;

a local server having means for communicating with
the central server via the telecommunications network,
means for downloading selected data files from the
central server, and means for storing the downloaded
data files; and

at least one client computer connected to the
local server via a local network, comprising input
means for allowing a user to specify a desired data
file; payment means for receiving payment from the user
for use of the desired data file; and processing means
for causing the desired data file to be processed;

wherein the local server and each client computer
are provided in an entertainment establishment.

Here, the expression "entertainment establishment"
includes (but is not restricted to) public houses,
bars, nightclubs, sports clubs, and restaurants.

In a preferred embodiment, the data files include
music files, and the processing means includes means
for causing reproduction of music files. In this case,
conveniently, the client computer or the local server
converts the desired data file into a music signal for
reproduction by a sound system of the entertainment
establishment. Preferably, music files are stored (at
least on the central server) in a compressed format

such as MPEG Audio Layer-3 (MP3), VQF, ASF, AAC or Real Audio. The sound system may either be one, establishment-wide system or a local system covering a restricted area.

In another preferred embodiment, the data files include video files, and the processing means includes means for causing reproduction of video files. In this case, conveniently, the local server or the client computer converts the chosen video file into a format suitable for display on a video system of the entertainment establishment. Preferably, video files are stored (at least on the central server) in a compressed format such as MPEG-2 or DIVX. Such files of course include audio data in addition to pure video.

In a further preferred embodiment, the data files include files for use in playing a game, and the processing means either includes means for executing the game itself, or means for sending files to a games machine for execution. One or more games machines may be connected to each client computer either via the local network or by individual connections.

The above embodiments may be combined such that the system handles any of audio, video and/or games files. In addition, the local server and each client computer may provide a telephony service by which a user's voice is received by the client computer, . converted to voice data and transmitted via the local network to the local server, from which it is routed to its destination via the telecommunications network.

Generally, it is desirable that each client computer be operated independently, so as to provide different users with separate desired audio, video or games files. However, preferably, the local server further comprises means for co-ordinating inputs from a plurality of client computers, allowing a number of users to participate in a common entertainment activity

(e.g. pub quiz).

In addition to purely entertainment-related functions, the system of the present invention may have other functions as well. For example, the local server may be connected to cash tills and alarm equipment, so as to form one integrated system for managing all the electronic apparatus housed by the establishment.

According to a second aspect of the invention, there is provided a client computer for use in an entertainment system, comprising:

input means for allowing a user to specify a desired data file;

payment means for receiving payment from the user for use of the desired data file;

input/output means for communicating with, and if necessary retrieving the desired data file from, a server via a network; and

processing means for causing the desired data file to be processed; wherein

the client computer is operable at least as a jukebox.

Preferably, the client computer causes processing of data files held on a local server to which it is connected via a local network, in accordance with the above first aspect of the invention. However, it is not essential for the client computer itself to process the data files; rather, it is sufficient for the client computer to instruct the local server to perform the necessary processing.

For example, when the client computer is operated as a jukebox, the client computer instructs the local server to retrieve the desired data file (which in this case is a music file such as a single song) and causes audio reproduction thereof through a sound system which may be connected either to the local server or the client computer.

The client computer may also be operable as a video player. In this case, it is preferable for the data file to be retained on the local server and processed (reproduced) there, rather than being transmitted to the client computer. In other words, a video file would normally be decoded by the local server and shown on a screen for general viewing. Nevertheless, dependent on the capacity of the local network video files may be downloaded to the client computer and reproduced on a local display.

The client computer may also be operable as a games machine. In this case, the desired data file is a file of games data which is processed by a processor of the client computer under control of a games program so as to carry out the functions of a particular game (e.g. a pub quiz game).

The client computer may include advertising means for displaying advertisements, messages and/or information either separately from its other operations, or in place of other operations when the client computer is not being used in another way.

The client computer preferably includes a screen which may provide the functions of part or all of the input means (e.g. touch screen), payment means (e.g. verification of credit card details), and local display (e.g. for showing video files, games, or advertisements).

Furthermore, the client computer may be operable as an ordering device (so that users can remotely order food or drinks) and/or may provide various staff or management functions such as alarms, paging and so forth.

A more detailed description will now be given, by way of example only, with reference to the accompanying Figure showing a preferred embodiment of the invention.

In the Figure, a system according to the invention

is shown in schematic form. The main components are: a central server 10 ("NetBox SERVER"), connected to a telecommunications network 30 ("Network access"); a local server 20 ("NetBox Local SERVER") connected to the network 30 and to a local network 50; and a number of client computers 40 (CLIENTS), only one of which is shown in the Figure, coupled to the local server 20 via the local network 50. These major components will now be described in turn.

The central server 10 exists at a remote location such as the premises of an Internet Service Provider or telecommunications company. It is a high-speed computer dedicated to the task of provided data files on demand, and to this end it includes a large-capacity storage (e.g. 100Gb) on which are stored many data files of various types. As indicated in the Figure, the central server stores: (i) ordinary music files intended to be enjoyed passively, one track at a time, such as recent chart hits; (ii) disco and karaoke files, for example long uninterrupted music files incorporating multiple tracks, and/or music files associated with text data or video for assisting karaoke singing, and/or music files specially prepared to remove the singer's voice; (iii) quiz files in the form of data designed to be transmitted to a plurality of client computers (located in one or more establishments) simultaneously; (iv) party files, i.e. music and audio data, which may be custom-built, for birthdays, retirements, weddings and so on; (v) aerobics files, which are music files augmented by voice or video data for assisting aerobics activities; (vi) theme night files, that is, music/audio data with content biased towards a particular theme such as 60's pop music, country and western, or Irish music; (vii) racing data, such as streamed video of actual (recorded or live) horse-racing events, with provision for

betting; (viii) games, which are data files for playing games on a client computer as explained below; (ix) movies, i.e. video files of film and/or TV programming either for general consumption or for viewing by an individual use; (x) training packages, i.e. data files containing text, video and/or music for use (preferably interactively) on a client computer; and (xi) one-arm bandit files, which are a particular kind of games file, either for turning a client computer into a one-arm bandit or for updating a dedicated gambling machine. Some of the above types of file are stored permanently or semi-permanently (possibly by offloading to archive storage such as optical disks), whereas other types of file are held only temporarily or merely buffered (such as streaming video of live events).

The central server 10 may further include software 12 ("Copyright Tracker") for registering use of individual files so that, for example, music copyrights and performing rights may be enforced.

The central server also incorporates software for billing purposes, and security software for permitting multiple concurrent access only by authorised establishments. Software required for implementing the system in the central server and elsewhere may be written in any suitable language (e.g. Java) and run on any of-the-shelf network server (or client) operating system.

The system of the invention could service many entertainment establishments using a single central server; alternatively, multiple such servers could be provided within the same country, e.g. to ensure data availability in case of network problems.

The central server 10 has a high-speed communications link to the telecommunications network 30. This network may be a public telephone system, in which case Internet protocols may be used for

transmission of data; however, a dedicated network using Internet protocols (i.e. an Intranet), or a network using other protocols could be used. If the Internet is used, this conveniently provides access to external providers of useful services such as web sites for credit card validation 32 or copyright and performing rights 34.

The local server 20, located in the premises of the entertainment establishment, is connected to the network 30 via input/output means 23. This will take the form of a modem, NTE (Network Terminating Equipment) or TA (Terminal Adaptor depending on the nature of the network connection. Preferably, a flexible network interface would be provided so as to allow access to all types of network topologies. It should be capable of handling various data transmission standards including V90, ISDN, ADSL, Kilostream and Megastream. The local server is a high-capacity ("thick-client") PC having a large amount of re-writeable storage, e.g. 50 Gb, as well as read-only storage in the form of a CD-ROM or DVD-ROM 22 provided behind a secure panel so as to allow exchange of media only by authorised personnel. Both types of storage are used for storing data files (music, videos, etc.) used by customers. A CPU 21 controls overall operation of the client in conjunction with software 27 providing the functions of stock control, staff control, alarm handling, billing etc. A video output 24 provides an analogue video signal to an existing video system 62 such as a large-screen television. An interface 25 (such as a USB or RS-232 port) provides a connection of the local server to other devices such as a till 63 or alarm system 64.

The client computer 40 in this embodiment is a wall-mounted unit having a touch screen for input and display. Additional input means are provided in the

form of a numeric keypad and a credit card reader for reading information on magnetic-strip cards or chip cards (smart cards). The playing of games or one-arm bandits is assisted by providing a joystick or control buttons. A coin slot and collection apparatus provides an alternative method of payment to the credit card reader, and a more familiar user interface when playing one-arm bandits. The touch screen, in conjunction with the other input means, provides the functions of a juke box 42, a one-arm bandit 44, and a quiz game 46 amongst others.

In addition, an advertisement display is provided in the form of a scrolling message, either by a separate display panel, or by using the touch screen during idle moments. As well as advertisements, instructions or facilities offered or on how to play games, announcements and other information may be displayed.

A telephone handset 48, incorporated into the unit, allows users to make phone calls either internally within the establishment or externally after forwarding via the local server 20.

As well as a network interface for linking into the local network 50, and a CPU for handling local processing, the client computer may be provided with its own internal storage (e.g. a 10 Gb hard drive) and a removable storage (e.g. CD-ROM behind a secure panel) although these are not essential. However, if local re-writeable storage is provided, this can be used to store temporarily data files recently requested by users, in case of a repeat request. For example, it may be expected that current chart hits will be commonly requested, and to reduce network traffic it may be desirable to store files for these locally. In this embodiment, each client 40 has an analogue audio output for providing music and other audio information

to an existing sound system 61 having an amplifier and loudspeakers. As required, each client either feeds audio to a common audio system for establishment-wide listening, or it feeds audio to a local audio system of

5 relatively low power, audible only within a relatively small area.

The operation of the above system will now be described for various types of data.

Music

10 If a user wishes to hear a specific piece of music, he goes to the client computer 40 nearest to him. A large pub or club might have 10-20 clients mounted on the walls at various points. He operates the touch screen by navigating menus and scrolling

15 through lists until he finds the piece he wishes to hear. Having selected it on the screen, he pays for it by swiping his credit card through the credit card reader of the client computer, or by inserting coins in the slot. The CPU of the client computer detects the

20 payment and either handles the verification/billing procedure itself, or forwards a request to do so to the local server 20. This in turn either processes the request itself or, if remote validation is required, sends the request on via the network 30. If the

25 connection of the local server 20 to the network 30 is via an ISDN line, the d-channel (data channel) may be used for this purpose.

Once payment has been verified, the data file corresponding to the selected music has to be accessed.

30 The client computer 40 looks first on its local storage (if any) to see if the requested file is available; if not, it refers to the local server 20. Assuming that neither contains the file needed, the local server 20 sends a request over the network 30 to the central

35 server 10. In the unlikely event that the central server does not have the file, the server 10 could

access the Internet to obtain it from an external
source. In any case, the server 10 retrieves the file
and sends it in compressed MP3 file over the network 30
(Internet) to the local server 20. Again, the d-
channel of an ISDN connection may be employed, in view
of the low data rate of MP3 files. The file is then
decoded and reproduced, either directly by the local
server 20 connected to a general sound system of the
establishment, or by the credit 40 receiving the
compressed file from the local server 20, then decoding
and playing the music either on a local or the general
sound system.

Video

The procedure is the same as for music, except
that instead of MP3 format, video is compressed using
an appropriate standard such as MPEG-2. In view of the
larger data quantity as compared with an audio file, it
is less likely that the required file will be available
on the local storage of either the local server 20 or
credit 40, and more frequent access to the central
server 10 will be needed. It may be necessary to
stream the data from the central server 10 to the local
server 20, or from the local server 20 to the client 40
such that video playback begins before the complete
file has been transmitted. Depending on the
capabilities of the client 40 display, the video
playback can take place either at the client 40 or on a
common video screen such as a projection TV. In the
latter case, there is no need to send the file over the
local network as the local server can output the
decoded video signal itself.

Games

If a user wishes to play an interactive quiz game
on a client computer 40, he selects the appropriate
item on a menu appearing on the touch screen. The

basic software for displaying questions and receiving answers is built into the machine; however, the questions are preferably selected at random from a very large library held on the local server 20 or central server 10.

As well as a solo quiz game for one user, the system allows a multi-player game by feeding the same set of questions simultaneously to all clients 40 in the establishment (or even to all clients in two or more establishments). In this case, software in the local server co-ordinates the checking of responses and the judging of the result. If multiple establishments compete with each other in the same quiz, the central server may be used to oversee the game.

Telephony

The user goes to the network client 40, lifts the handset and makes payment using the credit card reader or coin slot. He then places the call in the same way as in a public phone booth. The call is carried as voice data over the local network 50, for example using VoIP (Voice over Internet Protocol) and forwarded onto the telecommunications network 30 via the local server 20.

Ordering

If a user wishes to order food, he operates the touch screen of a convenient client 40 to input the requisite information, which is then passed over the local network to the local server 20. Once the details have been verified, a payment request is issued and displayed on the touch screen; in response to this, the user swipes his credit card. After the payment has been authorised (using external validation via the network 30 if needed), the food order is sent to a client 40 in the kitchen of the establishment.

Other

Other facilities will be available from the

central server to be downloaded to the requesting local server for an agreed fee (paid by the establishment concerned) or on CD-ROM. Some of these are as follows:

* Discos complete with online DJ
* Karaoke nights
* Distributed or local quiz nights
* Wedding receptions possibly custom built
* Birthday and anniversary parties
* Christmas and New Year parties
* Retirement parties
* Aerobics nights and keep fit classes
* Theme nights - e.g. Western
* Line dancing
* Race nights
* Online training offered to local business

A number of other facilities will also be available. Some of these are as follows:

* Local or national advertising
* Stock control
* Staff control
* Alarm handling
* VoIP telephony
* Payment by credit card

Although the above explanation has described one version of the system by way of example, there are numerous modifications and variations possible within the scope of the present invention.

For example, the above embodiment employs wall-mounted clients having touch screens. However, other types of client terminal can be envisaged for the local network, including computerised tills, mobile terminals, or table-mounted screens. Alternatively, or in addition, existing hardware in an entertainment establishment such as amusement machines, one-arm bandits and jukeboxes may be retro-fitted to perform the functions of a local network client.

The above embodiment employs a central server for storage and distribution of files. However, a purpose-built server is not required. Existing facilities, such as web sites providing music files for downloading, may be used to fulfil the functions of the central server.

The local server does not have to be located on the premises of the entertainment establishment. Depending on the networking technology available, the local network may extend to multiple establishments within a locality, all served by a single local server.

Although the system was originally envisaged for providing jukebox functions using compressed music files, this is not essential and the present invention may be advantageously applied for its other entertainment- and management-related functions.

CLAIMS

1.   An entertainment system, comprising:
a central server having means for storing data
5   files for use in electronic entertainment, and
connected to a telecommunications network;
a local server having means for communicating with
the central server via the telecommunications network,
means for downloading selected data files from the
10   central server, and means for storing the downloaded
data files; and
at least one client computer connected to the
local server via a local network, comprising input
means for allowing a user to specify a desired data
15   file; payment means for receiving payment from the user
for use of the desired data file; and processing means
for causing the desired data file to be processed;
wherein the local server and each client computer
are provided in an entertainment establishment.
20

2.   A system according to claim 1, wherein the
data files include music files, and the processing
means includes means for causing reproduction of music
files.
25

3.   A system according to claim 2, wherein the
client computer or the local server converts the
desired data file into a music signal for reproduction
by a sound system of the entertainment establishment.
30

4.   A system according to claim 2 or 3, wherein
music files are stored, at least on the central server,
in a compressed format.

35   5.   A system according to any preceding claim,
wherein the data files include video files, and the

processing means includes means for causing
reproduction of video files.

6. A system according to claim 5, wherein the
local server or the client computer converts the chosen
video file into a format suitable for display on a
video system of the entertainment establishment.

7. A system according to claim 5 or 6, wherein
video files are stored, at least on the central server,
in a compressed format.

8. A system according to any preceding claim,
wherein the data files include files for use in playing
a game, and the processing means either includes means
for executing the game itself, or means for sending
files to a games machine for execution.

9. A system according to claim 8, further
comprising one or more games machines connected to each
client computer either via the local network or by
individual connections.

10. A system according to any preceding claim,
arranged to provide a telephony service by which a
user's voice is received by the client computer,
converted to voice data and transmitted via the local
network to the local server, from which the voice data
is routed to a destination via the telecommunications
network.

11. A system according to any preceding claim,
wherein the local server further comprises means for
co-ordinating inputs from a plurality of client
computers, allowing a number of users to participate in
a common entertainment activity.

12. A client computer for use in an entertainment system, comprising:

input means for allowing a user to specify a desired data file;

payment means for receiving payment from the user for use of the desired data file;

input/output means for communicating with, and if necessary retrieving the desired data file from, a server via a network; and

processing means for causing the desired data file to be processed; wherein

the client computer is operable at least as a jukebox.

13. A client computer according to claim 12, arranged to cause processing of data files held on a local server to which it is connected via a local network, either by itself processing the data files, or by instructing the local server to perform the processing.

14. A client computer according to claim 13, wherein the data files include music files, and the client computer instructs the local server to retrieve a desired music file and causes audio reproduction thereof through a sound system which may be connected either to the local server or the client computer.

15. A client computer according to claim 13 or 14, wherein the data files include video files, and the client computer causes a desired video file to be displayed either by being decoded by the local server and shown on a screen for general viewing, or by being downloaded to the client computer and reproduced on a local display.

16. A client computer according to claim 13, 14 or 15, wherein the data files include game files containing games data, which is processed by a processor of the client computer under control of a game program so as to carry out the functions of a particular game.

17. A client computer according to any of claims 12 to 16, further comprising advertising means for displaying advertisements, messages and/or information either separately from its other operations, or in place of other operations when the client computer is not being used in another way.

18. A client computer according to any of claims 12 to 17, further comprising a screen providing the functions of part or all of the input means, the payment means, and a local display.

19. A client computer according to any of claims 12 to 18, wherein said input means and said payment means are arranged to allow a user to order food and/or beverage items available in an establishment where the client computer is situated.

20. An entertainment system substantially as hereinbefore described with reference to the Figure.

21. A client computer system substantially as hereinbefore described with reference to the Figure.

Application No: GB 0020342.2   **Examiner:** Kalim Yasseen

Claims searched: 1-21   **Date of search:** 27 May 2002

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

    UK Cl (Ed.T): G4V (VAK)

     Int Cl (Ed.7): G06F (17/60, 19/00); G07F (7/08, 7/10, 19/00)

Other: Online: EPODOC, JAPIO, WPI

Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
X	GB 2 314 647 A	(MULREANY) system for ordering goods and services	at least 12
A	WO 01/41023 A1	(MATSUSHITA) a content distribution system	
X	US 5 930 765 A	(MARTIN) a method of downloading files to a jukebox computer from another jukebox acting as an information node for a central server	at least 1, 2, 4, 12
X	US 5 781 889 A	(MARTIN) a jukebox computer that can download files from a central server, see column 5 line 54 et seq	at least 1, 2, 4, 12,